



## CONSERVATION BIOLOGY

# A Renowned Field Station Rises From the Ashes

After a frustrating hiatus, wildlife researchers are returning to a swamp in war-torn Aceh Province for a chance to study some of the world's smartest apes

**SUAQ BALIMBING, INDONESIA**—After an hourlong ride wending up the Lembang River[ck] through dense tropical rain forest, the speedboat sputters up to a rickety plywood dock. At the top of steps carved into the riverbank is a pair of shacks. Soaked clothes hang outside, drying. The Suaq Balimbing research station may look like hill-billy central, but inside it is buzzing with scientific life: 15 researchers and assistants jostling for space alongside generators, laptops, and cans of food.

No one is complaining about the cramped quarters. Suaq shot to fame in the mid-1990s, when researchers discovered tool use among orangutans here in Sumatra's Gunung Leuser National Park. Apart from humans and chimpanzees, no other primates have demonstrated such abilities, and Suaq remains the only location where orangutans regularly use stick tools to crack fruits and hunt for termites and honey. More recently, a landmark paper in *Science* (3 January 2003, p. 102) demonstrated that orangutan populations possess distinct traditions, skills, and social quirks: their own cultures. These orangutans "do things that we haven't seen orangutans do in other sites," explains Cheryl Knott, a primatologist at Harvard University. "[Suaq] helped change our views

and understanding of these animals."

For the better part of a decade, this unique window into orangutan culture was shuttered. At the end of the 1990s, an upsurge of violence in Aceh Province's long-running civil war forced wildlife researchers to abandon their work in the province. The Suaq team, led by primatologist Carel van Schaik of the University of Zürich, Switzerland, pulled out in September 1999, after insurgents murdered the station's head assistant. When van Schaik and his colleagues returned for a brief survey in 2006, they found that the Indonesian army had razed the station's two sturdy buildings. "The rebels had been using our camp, so the military didn't burn it down for nothing," he says. Boardwalks that traversed the research site—a 500-hectare swamp—had rotted away.

After the warring parties signed a peace treaty in 2005, researchers began to trickle back to Aceh. "The bad times are over," proclaims van Schaik. "People are getting back into the field."

Nowhere has the homecoming been more anticipated than at Suaq. Last year, van Schaik's crew and a Medan-based nonprofit, PanEco, built a modest replacement station and hacked a 46-kilometer trail grid for

**Cultured.** The orangutans of Suaq Balimbing are renowned for their distinctive behavior, including using tools to open fruit.

observing orangutans night and day. The collection of behavioral data resumed last September. Scientists couldn't be happier. "We were all waiting for this place to reopen," says Andrea Gibson, a Ph.D. student at the University of Zürich who had to delay her fieldwork for 3 years because of the hiatus.

### Cultured apes

During the rainy season, which lasts from October to March, trails at Suaq are waded, not walked. The knee-deep, pungent red mud has a powerful suction. "You can disappear in these waters," says Ellen Meulman, another Zürich University Ph.D. student. Leeches are ubiquitous, and king cobras and tigers lurk unseen. Among primatologists, says van Schaik, Suaq is known as "human hell" but "orangutan heaven." The shaggy apes are undisturbed—the nearest village is dozens of kilometers away—and food is plentiful, with some 70 kinds of fruit for the picking.

Meulman and her colleagues head out from the field station in the wee hours of the morning and slog for nearly 2 hours across perilous terrain to get to the orangutan nesting site before dawn. They don't get back to camp for their rations of rice and canned mackerel until after dark. In between, they track orangutan behavior in minute detail: Is a subject playing with a neighbor? Eating, and if so, what? Vocalizing? Using a tool?

The orangutans have some remarkable skills. For example, they know how to fashion a stick to crack open the razor-sharp shell of *Neesia* fruit. Van Schaik hypothesizes that they learned this skill after using simpler tools to dig for honey, fish for termites, and scoop for water. But it's unknown how these skills are acquired and transferred. "There's still a lot of doubt in the literature on this," he says. "We would really like to nail it."

One clue may be the friendliness of the lowland orangutans, who frequently gather in small groups known as "parties." "There are a lot of opportunities for social learning," says Meulman. "We're looking at what they're doing when they're together. We've seen teaching and cultural learning." Curious adults, for instance, will observe neighbors making umbrellas or gloves out of leaves and imitate those behaviors. Juveniles learn to build mosquito-repellent nests out of terentang leaves by watching their mothers.

Even simple nests, perhaps used for afternoon naps, suggest the presence of cul-

ture. “It was always assumed they randomly break sticks together and build nests the same way,” says Gibson. “But there are definite differences in the arrangement of branches [among groups].” For her research, Gibson has been scaling trees to examine old nests and plans to sleep in one of the 30-meter-high beds for a night. This has never been attempted, she says, apparently due to the possibility of attack from a reticulated python. But it’s worth the risk, she says: The data could answer basic questions, such as why orangutans sleep in nests rather than just out on a sturdy branch. “There are some things you have to experience firsthand,” she says with a smile.

With the return of primatologists to Aceh, research on orangutan culture is gathering momentum. Although Suaq has stolen the show, the research requires extensive collaboration with other study sites. Case in point: Van Schaik didn’t make the jump from observing tool use at Suaq to concluding that orangutans hold a deep cultural repertoire until he compared notes with scientists at five other field stations. Likewise, a 1999 *Nature* paper that first presented evidence for chimp culture required data from seven sites across central Africa to document the full range of their behavioral repertoire. “You can’t say anything about culture if it’s just one site,” says Knott. “You need the comparative perspective.”

Knott’s orangutan field station at Gunung Palung in Borneo also resumed work last year. She had shuttered it in 2003, after the staff became concerned that hostile loggers might become violent. Knott is studying differences in diet, vocalization, and reproduction to determine whether these behaviors have cultural or ecological origins.

Much of this research will be in collaboration with other sites, including Suaq and the Ketambe Research Center, the longest running orangutan field site in Sumatra. Take, for instance, the differences in foraging behavior. “Is this variation purely due to optimal foraging or social learning?” says Ketambe manager Serge Wich, a researcher with the Great Ape Trust in Des Moines, Iowa. “We want to know which kinds of food prompted cultural innovation.”

### Losing time

Because fieldwork stopped for several years across Aceh, it has been difficult to quantify the impact of the civil war on a biodiversity hot spot that is home to elephants, rhinoceroses, leopards, sun bears, tigers, and some 6500 orangutans. “Only now are many studies restarting,” says Wich. Although the fighting at Ketambe, in the island’s interior, was not as fierce as on the west coast near Suaq, researchers had to evacuate in 2002 and only returned 2 years ago. After compil-

be the key factor enabling otherwise solitary creatures to “teach” each other skills such as tool use, making Suaq the ideal laboratory for studying the origins of human culture, says van Schaik.

Ironically, the war may have given Leuser’s orangutans a reprieve. When Indonesia’s former President Suharto was ousted in 1998, illegal loggers were about to overrun the station. “The civil war stemmed that,” explains Ian Singleton, director of conservation for PanEco and a manager of Suaq. “The illegal loggers and poachers didn’t want to risk being shot, so the civil war was extremely good for conservation.” During the past 5 years, when Suaq was offline, Singleton released 100 rehabilitated Leuser orangutans back into the Sumatran rain forest.

But other threats loom large. Faced with expanding oil palm plantations, the resurgence of illegal logging and mining after the peace treaty, highway construction, and a booming pet trade, orangutans may become extinct in the next decade or two, says Singleton. A United Nations Environment Programme report published in February 2007 warned that 98% of the orangutan’s habitat—tropical rain forests—would disappear by 2022. Based on satellite imagery, the report listed Leuser as one of the most vulnerable hot spots. Last year, Singleton says, developers began draining swamps and burning forests north of Suaq for oil palm plantations.

Van Schaik knows that he and his colleagues can’t afford to lose more time. They plan to build a six-room dormitory,

install solar panels for a constant supply of electricity, and build three boardwalks to ease the trip to the research site. They hope to have the station restored to its former glory by fall. In the meantime, van Schaik is hiring assistants for an expanding research agenda. “We only scratched the surface before,” says Gibson. “We have the most intelligent and interesting orangutans. There are so many bubbling questions to be answered.”

—JERRY GUO

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**Up and running.** The research center in Sumatra’s Gunung Leuser National Park has been rebuilt after being occupied by rebels and destroyed by the army.

ing a 37-year data set, says Wich, “it was sad to have the gap.”

Although the primatologists at Suaq lost much more time—8 years’ worth of data—the 70 or so orangutans they study haven’t missed a beat. The concentration of orangutans here is higher than anywhere else in the world: twice the density of other sites on Sumatra and five times that of Borneo, the only other place where these apes are found in the wild. A vibrant population appears to